# Chemical Hygiene Plan Appendix C: Chemical Storage and Incompatible Chemicals

 The specific Safety Data Sheet (SDS) should always be consulted when doubts arise concerning chemical properties and associated hazards. Always wear appropriate personal protective equipment (e.g., lab coats, safety glasses, gloves, safety goggles, etc.) when handling hazardous chemicals. Know the locations of emergency eyewash stations and safety showers.

**Chemical Safety Storage Priorities**

Keep in mind that most chemicals have multiple hazards and a decision must be made as to which storage area would be the most appropriate for each specific chemical. First you have to determine your priorities:

1. **Flammability:** When establishing a storage scheme, the number one consideration should be the flammability characteristics of the material. If the material is flammable, it should be stored in a flammable cabinet.
2. **Isolate:** If the material will contribute significantly to a fire (e.g., oxidizers), it should be isolated from the flammables. If there were a fire in the lab and response to the fire with water would exaggerate the situation, isolate the water reactive material away from contact with water.
3. **Corrosivity:** Next look at the corrosivity of the material and store accordingly.
4. **Toxicity:** Finally, consider the toxicity of the material, with particular attention being paid to regulated materials. In some cases, this may mean that certain chemicals will be isolated within a storage area. For example, a material that is an extreme poison but is also flammable, should be locked away in the flammable storage cabinet to protect it against accidental release.

**General Storage Requirements**

* All chemicals must be clearly labeled.
* Label the storage location with the assigned storage group.
* Whenever possible chemicals should not be stored above eye level.
* No storage of chemicals, excluding detergents, under sinks.
* Every chemical should have an identifiable storage place and should be returned to that location after each use.
* Chemical storage in hoods should be minimized to avoid blocking rear baffles and interfering with airflow into the hood.
* Large containers should be stored on lower levels. Liquid chemical and toxic powers must not be stored on the floor.
* Larger chemical bottles should be stored towards the back and smaller bottles should be stored up front where they are visible. Chemical bottles should be returned with the labels facing out so they can be easily read.
* Chemical storage on bench tops should be minimized in order to reduce the amounts of chemicals unprotected from a potential fire and to prevent them from being easily knocked over.

**Chemical Segregation Scheme**

This chemical segregation scheme comes from the hazardous materials shipping regulations and this classification information can be found on the SDS in Section 14 “Transportation Information” also refer to Section 7 “Handling and Storage” of the SDS.

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| **Key****Hazard Class # - All Hazard Classes must be segregated from other Hazard Classes*** Class – must segregate from other classes within Hazard Class
	+ Group – recommend to segregate from the other Groups *within* Class
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**Hazard Class 1 – Explosive (potentially explosive)**

**Hazard Class 2 – Compressed Gases/Lecture Bottles**

* Class 2.1 – Flammable gases
* Class 2.2 – Non-Flammable gases
* Class 2.3 – Poisonous gases
* Oxidizing gases (separate from everything)
* Corrosive – acids
* Corrosive – bases
* Cryogenics
* Pyrophoric

**Hazard Class 3 – Flammable Liquids**

* Combustible liquids (that do not have another hazard)

**Hazard Class 4 – Flammable Solids**

* Class 4.1 – Flammable solids
* Class 4.2 – Spontaneously combustible
* Class 4.3 – Dangerous When Wet

**Hazard Class 5 – Oxidizers**

* Class 5.1 – Oxidizers
	+ *Liquids*
	+ *Solids*
* Class 5.2 – Organic peroxides

**Hazard Class 6 – Poisons**

* Class 6.1 – Poisons
	+ *Liquids*
	+ *Solids*
	+ *Carcinogens*
	+ *Reproductive hazards (Teratogens, Mutagens)*
	+ *Irritants*
	+ *Organic acids, solid*
	+ *Nonhazardous chemicals*
	+ *Poison Inhalation Hazards (PIH)*
	+ *Cyanides (need to be locked up)*
	+ *Controlled substances (need to be locked up)*
* Class 6.2 – Biohazards, Infectious Agents
	+ *CDC Select agents*

**Hazard Class 7 – Radioactive**

**Hazard Class 8 – Corrosives**

* Inorganic acids
* Oxidizing acids (nitric acid and Perchloric acid)
* Hydrofluoric acid
* Organic acids, liquids-can be stored in a flammable cabinet
* Bases
	+ *Liquids*
	+ *Solids*

**Hazard Class 9 – Miscellaneous**

For Longwood University segregation purposes, these materials can be stored with Hazard Class 6 – Poisons

**Incompatible Chemicals**

**Table 1** contains a list of incompatible chemicals. Per row, the chemicals listed in the left column should not be used with listed in the right column, except under specially controlled conditions. Per row, chemicals in the left column should not be stored in the immediate area with chemicals in the right column. Incompatible chemicals should always be handled, stored or packed so that they cannot accidentally come in contact with one another. These lists is representative of chemical incompatibilities and is not complete, nor are all the incompatibilities shown.





**Special Segregation of Chemicals**

**Table 2** contains examples of dangerously incompatible substances. Per row, the chemicals listed in the left column are dangerously incompatible with chemicals listed in the right column. Per row, chemicals in the left column must be stored away from chemicals in the right column so that accidental mixing will not occur.



**Table 3** contains examples of incompatible oxidizing agents and reducing agents. **Every chemical in the left column is incompatible with every chemical in the right column.** These chemicals must be stored away from one another so that accidental mixing will not occur.

